This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

Med 17.19

10

Harvard College
Library

By Exchange

NO L
BROWN UNIVERSITY

NO LONGER THE PROPERTY OF
BROWN UNIVERSITY LIBRARY

One of the most difficult sanitary lessons to learn is that tolerance of evil conditions is not proof that the conditions are not evil.

"Any kind of training is far more effective and leaves more permanent impress when exerted on the *growing* organism than when brought to bear on the adult."

— *William James*, "*Psychology.*"

Med 4379.14

HARVARD COLLEGE LIBRARY
BY EXCHANGE
July 23, 1941

Copyright 1907
By ELLEN H. RICHARDS

Composition, Electrotyping and
Presswork by
Thomas Todd Co., 14 Beacon Street, Boston, Mass.

he must nevertheless face the problem of retaining health and strength under the strain of modern progress and civilization. Formerly a man's occupation in the fields and woods kept him in health, but now he must ordinarily give what strength he has to his occupation, and rely upon other sources from which to secure a healthy body.[1] It is possible to understand the effect that is produced by unfavorable environment, if we compare the difference in physical stature between the Scotch agricultural worker and the inhabitant of certain manufacturing towns in England. There is an average of five inches in height and thirty-one pounds in weight in favor of the Scotchman. H. G. Wells, in speaking of the responsibility for man's physical efficiency, compares the city dweller in crowded streets and tenements with the man living in the freer, more open country, and makes the difference from three and one-half to five inches in stature and from twenty to thirty pounds in weight in favor of the country dweller.[2] The former belongs to the physically unfit for the struggle of life.

A casual observer visiting the poorer parts of one of our large cities must necessarily be impressed with the stunted appearance of the children on the streets.

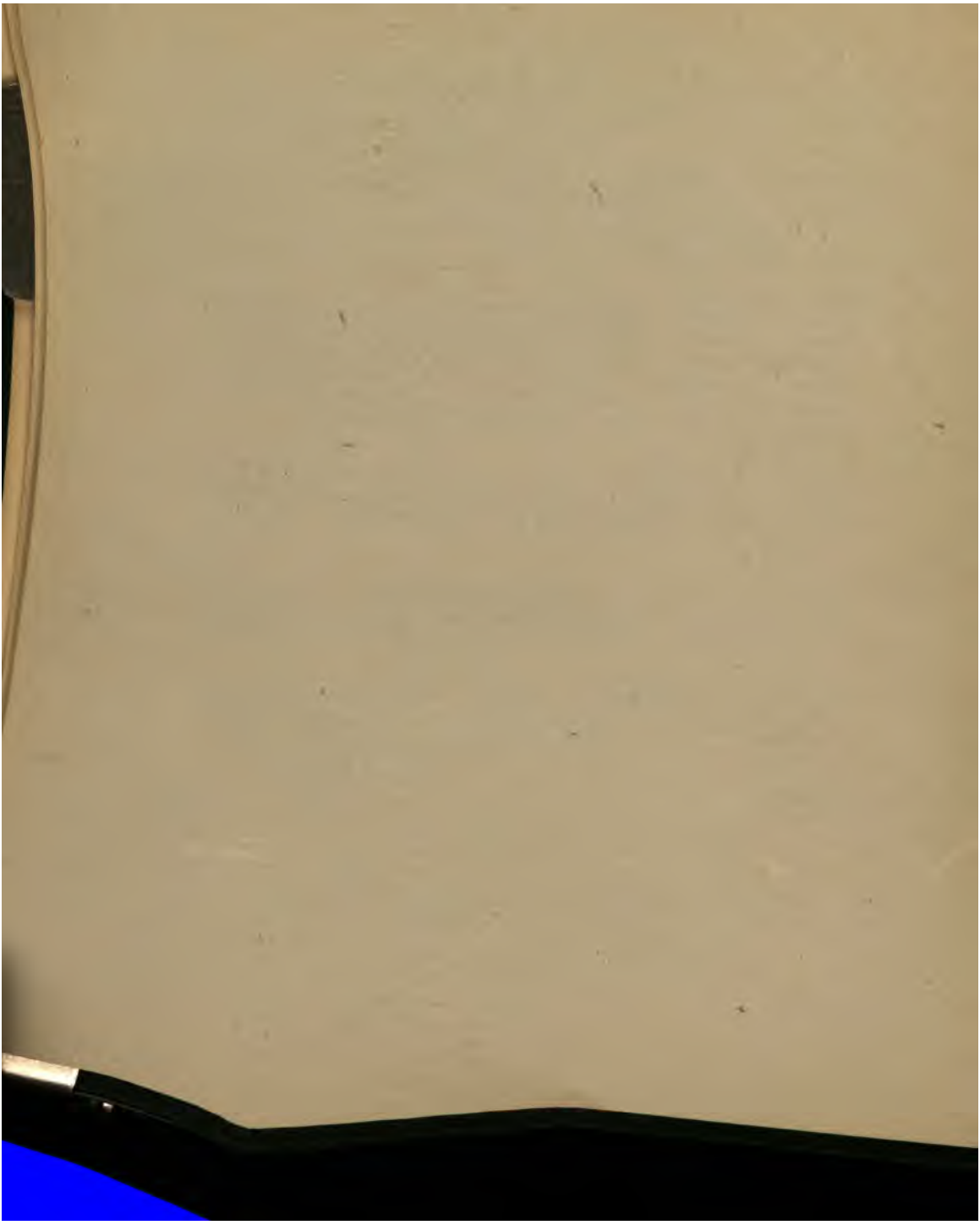
Since physical strength and power have always been desired by man; and since, in these modern days, women wish to be not far behind their brothers in endurance, the facts just given should furnish food for serious thought as to the means of acquiring a body physically

[1] D. A. Sargent, "Health, Strength, and Power."

[2] "Mankind in the Making."

The second law enjoins such use of the air, water, and food necessary to life that the person may be in a state of health and efficiency.

This right use depends so largely upon habit that a great portion of sanitary teaching must be given to inculcating right and safe ways in daily life.



erous person because he carries living microbes do not wish to get into our clean bodies. are many kinds of tiny organisms doing their work of turning waste matter into useful true sanitarians obeying the first law of to get rid of all useless matter. Working in heaps, all wet gutters, all dirty corners, and damp, dirty clothes are these tiny organisms which not wish to have on our faces, or in our throats When these are dry they blow about the fill houses, cars, shops; settle on books, desks, banisters. They are wiped up by warm, moist which carry them to food, mouth, eyes, noses. some disease may set in because, among these obes, a few disease germs were carried.

One of the best instances of danger in dirt is that the tetanus bacillus or the germ that causes lockjaw. very common in garden dirt, and that many persons it on the unclean skin is proved by the frequency which it develops in cases where the clothing over injury has not been torn.

In fact, one never can tell when dust is what is often "clean dirt" and when it is dangerous; therefore, all dust. Keep the mouth shut when in any dusty Alas! all places are dusty if one could only real-it! The white beam of the search light at night, stream of particles seen in a dark room when a beam unlight is let in, show us now and then what is there the time.

Sanitation is keeping clean, not merely cleaning up disinfecting, which seems to be the common idea.

temperature for 36 to 48 hours. At the end of this time numerous colonies will have spread themselves in the stiff jelly. Numberless variations of this experiment will occur to the teacher.

It is advisable to give each student at some time, if not to all at once, two prepared dishes to take home, one to be exposed when the room chosen has been quiet, or thoroughly cleaned, at least 2 hours before, and one after disturbance has "raised" the dust.

3. To show the efficient way to get rid of dust, choose a suitable room, have it swept, and set the class the experiment of dusting it with (1) a feather duster, and (2) a dry cloth, as janitors and housemaids usually do the work. Expose prepared dishes at the end of 10 minutes, half an hour, 1 hour, 2 hours. (3) The same room swept in the same manner dusted with a *dampened* duster, not a wet one. Repeat the tests. Keep careful records, when possible photographic records.

[To show how dust is carried on hands, a finger print made on a Petri dish, or a swab taken from the nose, if a physician or bacteriologist is at hand to explain, will give a culture which will be remembered always.]

It is not necessary to determine the names of the plants growing in these colonies. The purpose of the experiments is simply to prove that the dry, ordinarily invisible dust which we breathe does contain living organisms and possible sources of harm.

The number and variety of the experiments to be made in the growth of dust organisms will depend upon the individual conditions and the interest of the pupils.

material may be prepared in the chemical laboratory or with sufficient care, at home.

Petri dishes are simply flat glass dishes of convenient size, with covers of thin glass, so that the colonies of germs which grow in the transparent medium may be seen and counted. They may be bought at a supply store for bacteriological apparatus, and after using may be cleansed. They are sterilized for further use by baking, as follows: Place them, with covers on, in a pan in a cool oven. Slowly raise the temperature to about 300° F., a temperature for baking bread or for yellowing a piece of paper in half a minute; open the door, draw the pan to the front, allow the temperature to cool as slowly as it was raised, to avoid the cracking of the glass. When the pan is cool enough to take up with the bare fingers, remove to a table and allow to cool to room temperature; then place a rubber band over the cover and dish and set away for use. As the least exposure in any place is liable to collect dust, the cover is kept on the dish.

To prepare a stiff, but not too stiff, transparent medium in which germs will grow has been the study of many laboratories for many years and improvements are constantly made.

In general, it may be said that the organisms are planted in nutritive media which favor their rapid growth, which are transparent, and are solid enough to keep the different individuals apart when first sown, but which permit the new growth to form clusters or colonies that may be counted.

Beef broth is the common basis, made from lean beef,

cup of warm water. Heat in double boiler, stirring
ften until water in water pan has boiled 15 minutes.
emove inner dish, place directly over the fire, and allow
oth to boil 10 or 15 minutes. Clean by straining
ough two or more thicknesses of cotton flannel wet in
l water. Squeeze the meat carefully to get out all its
es but not much fat. The meat is acid, therefore
from one—eighth to one-quarter teaspoonful of bi-
onate of soda. Replace the water lost through
poration.

"Moisten 3 heaping tablespoonfuls of finely divided
ıtine in a very little cold water and add to the boil-
hot broth. When the gelatine is dissolved, strain
ugh hot flannel.
'Put 3 or 4 tablespoonfuls of the broth into each of
al small bottles. Plug the mouth of each with a
wad of cotton wool, or tie over each a thick mat
same. For three successive days place the bottles
t on a piece of folded cloth in a pan of cold water
il them 15 minutes." [1]

ott, "Household Bacteriology," Vol. II. Library American
Home Economics.

CHAPTER II

THE CLEAN CITY

"We suffer from disease through ignorance. We escape through knowledge."— *Benjamin Ward Richardson.*

THE eagle in his mountain aerie has as clean a home as the world affords. There are only cosmic dust, ashes of volcanoes, pollen from trees, with now and then a spore of some moss or lichen in the air he breathes. The explorer in the arctic regions never "takes cold," for there are no germs to cause the catarrh.

The country dweller on a large farm need not breathe bad air if he would live out of doors and sleep with wide open windows.

But the city dweller is at the mercy of the careless habits of thousands of his fellow-beings, and of the ceaseless grinding of streets into powder, and of dust from all things subject to wear, from clothing to iron rails. An examination of the air of the New York subway showed the solid dirt sifted from it to contain sixty per cent. iron dust.

As long as we must go to and fro to work, to school, to shop, we are subjected to the city ideal of cleanliness. We should be helpless if it was not possible for each one of us to have a voice and influence in community life.

Public opinion could stop the sweeping of house, shop, and schoolhouse dust into the street, could de-

mand suitable receptacles for it, and could insist upon crematories for all wastes.

The point of this lesson is: each should do his share in making a clean city; each should dispose of his own wastes in a manner safe not only for himself, but for his neighbor. Then only has he a right to insist that his neighbor do the same.

It is safe to say that two-thirds of the work of cleaning up is needless work, and so in itself waste, and that the danger is increased tenfold by the delay in getting rid of the decomposing materials.

Observe the reprehensible habit of tossing banana skins, lunch papers, envelopes, into the street or onto a vacant lot. Observe the rubbish along one block of a city street or one-quarter mile of a village street, or in the yard of a farmhouse. It is human hands that cast away used things to the peril of their neighbors' lives.

A social conscience must be developed to cause each one to refrain from menacing his neighbor

By "the clean city" is meant all the environment common to the community and beyond individual control. Climate is beyond community control except in so far as very limited modification of dry weather may be made by abundant use of water. We must bear heat and cold, snow and fog, in the place in which we find ourselves. But intelligent man need not suffer if he will learn what the different conditions require. If man will use the knowledge he may gain, he can protect himself under nearly all circumstances.

An excellent illustration of the value of sanitation is given by the control of malaria and yellow fever. Not

many years ago a malarial or yellow fever country was avoided as a necessarily dangerous region. Now our men are living in health and comfort in several such countries, Cuba, the Philippines, and Panama. A certain kind of mosquito was found to be a carrier of disease, and in order to make these countries inhabitable the authorities needed only to combine to stop the breeding of the pests, by draining marshes, covering pools with kerosene, and by screening houses to keep out the strays.

It is conclusively proved that a united effort to exterminate the mosquito, to prevent the breeding of flies by leaving no manure piles and no heaps of dirt, to get rid of fleas, etc., may improve the health of the community in a marked degree.

Just as soon as the taxpayer realizes the saving in money by the lengthening of life and lessening the expense involved in sickness, he will be willing to have money used by public authorities for these purposes. To repeat: the range of temperature, humidity, and sunshine is independent of man. Not so, however, is presence of stagnant pools of water to breed mosquitoes, or of piles of rubbish to scatter dust and breed flies and harbor rats.

For all common pathways of the community—roads, streets, alleys, and sidewalks; for all public buildings—city halls and schoolhouses; for all places frequented by large numbers—parks, markets, bathhouses, boat piers, railroad stations, street cars and steam cars, the community must be responsible. The condition of these public places of concourse and conveyance reflects the sanitary standards of the community. A stranger ma

at a glance how far in the scale of cleanliness a given
n has risen. The village store and post office, for
nce, are good evidence. It is the accumulated waste
e many that makes the offensive mass and convicts
of breaking the first law of sanitation—quick re-
of all that is done with.
ew Words on each of these things used in common
he people of a locality will suggest others which
follow ed up. Parks, markets, public gathering
ide walks, public pathways, have important sani-
ect in two ways. Dried sputum, excrement, de-
ood or refuse may be lifted by the wind and
over a radius of several miles; not only onto
eets, but onto the roofs of houses to be washed
erns; into markets to fall on fruit and meats;
w indows of houses to be breathed by the inmates.
Such material is wet with rain, or dampened
alter ing cart, it may be taken up as mud on the
the passer and tracked into clean stores, school-
; or it may be collected on clothes and stock-
so carried into sleeping chambers to be shaken
window into the air breathed by persons who
be en out of the clean yard.
es e and other reasons, it is a duty of the whole
to protect itself by insisting on clean path-
a duty of the school and home to insist that
be cleaned and clothes brushed outside their

rk s and squares, receptacles for all waste
pr ovided, and the frequenters should *use them.*
ds to the disposal of the great accumulation
a community.

The wastes to be disposed of may be roughly grouped into three classes: ashes and rubbish; garbage; sewage. The ashes and rubbish, broken bottles, paper, tins, etc., are not in themselves dangerous, but they collect germ-laden dust and blow about; or they hold water to breed mosquitoes and are unsightly. They may be used on a dump for filling, if they do not there blow about and collect water. Such piles are usually picked over and all valuable portions saved. If this is done at once, and if such rubbish has been kept clean and separate from garbage and house sweepings, this may not be harmful; but such a dump is usually a menace to the whole neighborhood, and a breeding place for mosquitoes. It is on the whole a doubtful saving.

Garbage is the perishable waste of kitchen and market, bits of raw and cooked foods, bones, vegetables, withered flowers. The contents of the kitchen middens of the archæological early man were of this character. When the heap overtopped it he moved his hut. Modern man keeps his house in the same spot, and sends the refuse off in a cart to the farmer to feed pigs, or dumps it in the sea.

Because it is perishable, it is food for bacilli and home of bad smells. Perhaps its worst offense is breeding flies. Like all other wastes, it should be disposed of before decomposition sets in. Garbage should never be dumped in the open or used as filling. For isolated houses with plenty of land it should be buried in loosened soil. For city garbage various schemes of utilizing the grease and nitrogen have been proposed and some tried, but from a sanitary point of view it

r it as waste to be disposed of at

of houses or streets, should be
he danger from disease germs;
esent, a universal ingredient.
d waste of water-closet, bathtub,
undry tub—is dirty water with
of dirt, but it is a dangerous dirt
sewage is suspicious.
plies with the law of quick re-
city precincts, but its after dis-
problem. In the not far distant
ill be purified before being dis-
into streams. The municipal
io, is one of the well-known

se or institution, sand filtration
isest method to be adopted, not
t for safe conversion into plant
; a common term. The princi-
in arid regions hold here. A
a septic tank allows the solids
ed out and soaked up by the
itrifying plants at once convert
nto nitrates, forming food for

emation has already been re-
terial—paper wrappings, paper
ice or decayed fruit, scraps of
and, when moistened, breeds
ria, some of them harmful to

man, and all meaning decay and filth. The sweepings of houses and offices, dry lint from clothes, wood chips from pencils, threads, dust, and mud whirled in from the street by the breeze, or brought in on shoes, are too often swept into the street or left by the door.

Scraps of lunch, bones given to dogs, stones and skins of fruit, all find their way to the corners by house and sidewalk. The useful microbes do their best to get all such waste into the form of food for plants, so that it will be no longer waste; but meanwhile it is not pleasant to see or smell decay. All such wastes should be burned at once and thus be transformed into plant food in the ashes and the gases which are given off.

The kitchen wastes are more difficult to dispose of because food stuffs have more water, which smothers the fire, causes smoke and a bad odor.

Well-constructed crematories, whether of the simple sort in the vacant lot or the city plant, have something of the nature of a shelf on which the wet stuff may dry before being thrown into the fire. Most households and villages have enough paper and dry waste to burn the rest without any other fuel. The one need is a good draft, tall chimneys or forced draft, to give air enough for complete combustion. It is only incomplete combustion that gives odors.

A few years ago this method of getting rid of wastes would have been considered wasteful. The paper, the cloth made of cotton and linen rags, could be used over, the garbage could be fed to pigs and hens. It was then thought that the nitrogen was lost if food scraps were burned and the gases sent into the air. It has been

clover and pea plants, especially,
aring nodules on their roots which
ı of the air into nitrates, or a form
:s take the needed carbon from the
ıse for allowing refuse to rot rather
ashes prove the best of fertilizer.
:itchen waste may be safely fed to
it may be given to them fresh and
; of the garbage pail of the village
if left for two or three days to
ween deposit and use.
an axiom that one of the most
sanitation is the well-constructed
alize more and more the value of
/astes more quickly.
e when most market refuse will
nters, and when the individual
to deal with corn husks, cabbage
But as long as she has these
he must keep her garbage pail
'henever emptied. That means
: shall the washings go? That
ı to be washed with soda in the
it must be emptied every day.
pay for the city cart daily, or
ouble to care for the garbage
:eter and there will be fewer
about.
)etter than cure. While it is
:tuce, and berries, it is much
:her articles as clean as possi-

The driving of a load of uncovered meat through the streets or along country roads should not be tolerated by the buyer. Besides the dust there are flies, and we have learned that they are not only disagreeable, but they may be dangerous.

The picking of berries and small fruits by careless country children is a danger, for not all country people are in good health; moreover, they too often excuse grimy hands and greasy clothes with the plea of trouble in getting a sufficient supply of water.

Civic pride in clean markets should be encouraged and each purchaser should patronize only the cleanest. If plenty of hot water and towels and clean frocks cost more to the butcher, then we must be willing to pay more to him. Thus we may pay less to the doctor and nurse, and gain more good out of life by being well.

The screen will keep off flies, but it will not prevent the settling of fine dust. There is in a suburb of a Western city a really clean market. Why are there not more?

The American favorite ice cream may become a source of danger in hot weather if it is prepared in an unclean place, or is kept over and refrozen after being melted. It is a safe rule never to buy ice cream from a push cart or street stand.

Cream cakes and whipped cream confections are not good food in hot weather.

Just as common needs have developed community oversight of roads and sidewalks, so universal need of light and water has produced the public utility of gas, electricity, and water supplies. It is necessary only to

hese here, since they are under expert super-
all well-conducted towns. The sanitary dan-
ıostly connected with improper house fixtures,
be considered in the chapter on the house.
ne thing do we find more perfect justification
ıt sanitary measures than in the case of a
ıpply. The death rate of infants is about
ent. In a city of 500,000 inhabitants several
dren have been liable to die in a summer,
r from bad feeding, and mostly from dirty
is nothing, when it comes to increasing the
mpared to filthy milk." Vigorous meas-
and town must be used, for the single
powerless.

rural communities, however, each user
now how the cows and cow stable from
s sent are cared for.
cooled at once and kept cool from 50°
keep sweet thirty-six hours at least.
ıo sediment in the bottom of the vessel
, and it should have no peculiar taste

saying that no preservative should
luce clean and safe milk, the stable,
ıe milker (as to his hands especially),
ously clean—bacteriologically clean,
he house, milk should be protected
ho have no cool dark place in which
great disadvantage. Milk is such
a that they thrive at a prodigious
ture permits their growth. New-

gives an experiment on a sample of milk which at 32° F. (0° C.) contained 3,000 bacteria per c.c. The portions kept below 55° F. (13° C.) showed very little increase in twenty-four hours, but the portion at 60° had 180,000; at 68°, 450,000; at 86°, 1,400,000,000; at 94° (35° C.), 25,000,000,000.

It may be that, just as great pipe lines have been laid to carry clean water for 50 to 200 miles and oil for greater distances, so pipe lines will be laid to give that equally necessary fluid, clean milk, to a large city; but at present it must be brought in cans 200 to 300 miles and handled two or three times before the consumer finds it on his breakfast table.

Milk differs from oil and water in that it is a perfect mixture in which to cultivate many kinds of plants, and all seeds and spores as well as plants must be kept out. For discussion of milk see Newman, "Bacteriology and the Public Health," and local bulletins and reports.[2]

It has been said that the milk problem is to get done what we know how to do, and it is an excellent illustration of the need of co-operation between the individual and the community. For instance, the milk cans turned to the milkman from retail stores, bakeshops, and from many private dwellings are in an absolutely filthy condition not only from neglect, but because of use for improper purposes.

Each housewife should see to it that receptacles for

[1] "Bacteriology and the Public Health," p. 188.

[2] U. S. Bureau of Animal Industry, Bulletins Nos. 20, 46, and 81, and Farmers' Bulletins, Nos. 63 and 74, on milk, the care of milk, and the milk supply of large cities.

pure carbon, which requires a higher heat and fine division for complete combustion.

Bread contains only about 45 per cent. water and so burns rather readily. A slice of potato treated in the same way needs to dry longer in order to evaporate its 75 per cent. water. A slice of apple, or tomato, or a melon rind with 90 per cent. of water must be dried longer still, but when dry the result is the same. It is this need of drying which makes cremation of garbage costly, unless some source of waste heat is available, or some other waste is at hand to mix with it.

Experiment 2. Place on the hot iron a thin slice of suet or of butter or a teaspoonful of cream. A little water will escape, but the mass will soon give off inflammable gases and burn brilliantly, leaving almost no residue. There will be some sooty smoke because the air cannot get to it quickly enough to burn it all. If some of this fat can go in with the other garbage, the whole will burn admirably. But fat is too valuable to dispose of in this way; it has too many uses, so it is abstracted from the refuse.

Experiment 3. Place a thin shaving of beef or chicken or ham on the hot plate and treat as before. The same results will follow, with the addition of very disagreeable odors. The smell of burning flesh is sickening.

All residue containing nitrogen, such as bones, hair, woolen, etc., gives off most unpleasant odors with the gases formed, so that a specially constructed furnace to consume these gases is needed. With this there is no difficulty. The burning gases and charcoal should be used to dry the other garbage and even to furnish power.

TO ILLUSTRATE CHANGES IN MILK

ure a sample of really fresh, clean, cooled milk
e than 6 hours from milking. Compare this
ples bought at various places.

ure out 5 c.c. of each into a small beaker, dilute
c.c. of water, add 3 drops of the indicator
phenolphthalein, and from a burette add drop
with stirring, sodium hydroxide one-tenth nor-
ion (4 grams NaOH in 1 liter) until the mix-
aintly pink. Each tenth of a cubic centimeter
dium hydroxide used is counted as a degree of

acid is chiefly lactic acid formed from milk
the action of B lacticus. The fresh milk should
than 10°; when the test shows 23° the original
ill coagulate on boiling. Some samples may
igh as 100° and yet no harmful results follow
Apparently the harmful fermentations which
are those which affect the nitrogenous con-
yield ammonia, and so tend to neutralize the
For this reason no decision can be reached
y of milk by chemical tests.
ely normal milk gives the amphoteric reac-
s, it turns delicate red litmus paper blue, and
red because neutral and acid phosphates are

ri dishes may be used to show in general the
germs, and a description may be given of
s by centrifuge for pus cells, dirt, etc., but it
able to take time for the class to go through
es.

Qualitative tests for dirt may be made by filtering through closely packed absorbent cotton.

Leach recommends the following simple test for the presence of formaldehyde:

To 10 c.c. of the milk in a white porcelain dish add 8 c.c. of hydrochloric acid (1.2 sp. gr.) and 2 c.c. of a 10 per cent. ferric chloride solution; heat gently nearly to a boiling point, stirring all the while to break up the curd. More or less formaldehyde gives deeper or lighter violet color. One part in 250,000 parts of milk may be detected.

IAPTER III

IE CLEAN HOUSE

f the house, a space inclosed by four
cut up into smaller spaces, consists in
r clean, the water supply safe, and the

closed spaces soon becomes over-
he products of respiration, among
on dioxide and moisture. The car-
rom the processes of decomposition
ody whereby warmth and energy are
dioxide is a waste product which is
l should be at once removed, like any

ans are inclined to believe that of all
e vitiation of the air is by far the most
emits as much CO_2 through respira-
be produced by about one-half pound

er be quite clean and fresh, because it
at and often is contaminated by the
stion from lamps and gas, from cook
s, and by deleterious gas from unclean
nds, from dirty back yards, from leak-
d from furnace gas. Gases and fluids
ts in sewer pipes add to the contami-
n cooking and dust from carpets and

furniture, until it is no wonder that so many persons suffer from "colds" and from that general debility which allows the attack of many diseases.

Tuberculosis is especially a closed-space disease. Considering the bad quality of the air that so many persons accustom themselves to breathe, it is a matter for wonder that no more persons are sick.

In the cities, owing to the cost of buildings and land, the cubic air space for each person is growing smaller and smaller, until the law has stepped in and required 330 cubic feet of space for each person in a tenement, in a schoolhouse, in a factory.

The law leaves the demand for air to the good sense of the ordinary house dweller, who is learning only slowly that his brilliant gaslight of an evening, his tight steam-heated apartment, his one-window bedroom, are slowly sapping his strength.

The effort now made to educate the whole people in the use of fresh air as an important factor in curing and, still better, in preventing tuberculosis will have good results in the direction of general health as well as in any specific case.

The three essentials for healthful life are food, water, and air, and the most important of these is air. In this most medical men and hygienists are agreed. While we eat perhaps three times a day and take water every few hours, we breathe, upon the average, twenty times a minute, or 28,800 times every twenty-four hours. So constant a function must be an important one. We are told that if air could be withheld from us for six minutes, we should die. Moreover, where abundant oxygen is

he air, the quality of the food is of much less
: than when the air is vitiated.
·e numerous historical records of deaths from
air. We remember learning that of the 146
fined in the Black Hole of Calcutta, 123 died
t.
ıor has said elsewhere that "nothing will take
fresh air. It is one of the necessities of
The child should be taught to recognize
to demand fresh air as he now demands a
ter. Study rooms at home and in school
etter facilities than nine-tenths now have,
ssen the 'partial death rate.'" "The child
to heed this call [for oxygen] as much as
t is imperative that fresh air, not used-up,
-and-over-again air, should flow through

rthright of every child to be allowed fresh,
reathe and be taught how to fill his lungs
ep breathing. If he once recognizes the
:t of unclean air and becomes accustomed
ıe has acquired a valuable asset for life.
danger from tuberculosis, and in less dan-
; and throat diseases.
e body does adapt itself to surrounding
o reason for making those conditions as
le. The pale and pinched appearance of
the crowded city is caused more by the
ir than by any other one thing.
sufficient air without dust and without
reat problem of the city dweller, and he

must use all his common sense and ingenuity to secure this.

Examine briefly the constituents of the air. The composition of the air shows, on an average, 20.93 per cent. oxygen, 79.04 per cent. nitrogen, .03 per cent. CO_2, with traces of ammonia, ozone, argon, krypton, neon, metargon. These parts do not form a chemical compound, but are mechanically mixed.

Air at the height of 15,000 feet has been found to have the same composition as at the sea level. Atmospheric pressure, however, influences cell life, so that a change to a higher altitude usually has a stimulating effect.

Ozone is a form of oxygen containing three atoms of oxygen to the molecule instead of two. It is produced by electrical disturbances, and is found in some abundance, caused by the atmospheric electricity, at the seashore and on mountains. The name, coming from the Greek "I smell," is interesting, having been given because of the peculiar odor that was observed during a thunder storm, and later in the presence of an active electrical machine. It may be that it is this ozone in the air that makes in large part the life-giving quality of sea and mountain air.

A variety of causes may contribute to change the quality of the air indoors, vitiating it so that it is unfit to be breathed. There may be too much CO_2, and consequently too little oxygen; there may be too little moisture; there may be too much moisture, or there may be substances, such as dust, suspended in the air; there may be noxious gases or impurities from respiration.

under personal hygiene, such as the avo
food, which requires the evaporation of m
the body surface to carry away the uni
wearing of light and porous clothing, etc. but
that, in climates where such days are only occasional and for that reason are not prepared for, the installation of drying apparatus is desirable and not impossible. Precautions as to food and undue exertion on hot days with high humidity should be general, in order that the blood pressure should be reduced and escape from sunstroke made possible.

In cold winter weather when halls are heated by steam the air may become too dry for comfort. Hot water heating and good ventilation will obviate this difficulty.

At all temperatures moisture exists in the air in an invisible state. A rise of temperature increases the capacity of the air for moisture to a certain limit when the air is said to be saturated. This capacity of air for moisture increases more rapidly than the temperature. Air at 32° can contain 160th part of its own weight; at 59°, the 80th part; at 86°, the 40th part, the law being that for every increase of 27° its capacity is doubled. The dew-point, or the temperature at which the moisture begins to condense, may be determined by placing a thermometer in a polished metal cup and dropping in small pieces of ice until moisture appears on the outside. The temperature read must be that of the cup and not of unmelted ice. The experiment takes time, therefore the device of the so-called wet bulb with constant evaporation is most convenient.[1]

[1] Signal Service Notes, No. III, "To Foretell Frost." By James Allen. Washington office of the chief signal officer of the Army.

e several registering humidity test-
schoolroom and records kept. But
kept, the pupils should set up for
one of two common but correct
zero point is the same. About the
n of embroidery silk, silk gauze, or
ton wick such as is used in alcohol
point is that it shall by its capil-
from the bottle suspended below,
y, to replace that lost by the evap-
lb, cooling it in proportion to the
on.

ıould be soft and the silk or cotton
d not allowed to become caked with
handling with the fingers.

eters are hung side by side three or
l of course out of reach of the sun.
e is most convenient for any one
nce it gives a means of foretelling
b registers the dew-point or the
e to which the thermometer is to
wind intervene. Thus if at nine
evening the air thermometer reads
reads 48°, a difference of 12°, the
to 31°. If the air is 45° and the
s lower, or 38°, the final tempera-
25° with killing frost, whereas if
nce of two degrees it will fall to
safe.

DEW-POINT

Difference between Reading of Wet and Dry Bulb

Air temperature.	0	1	2	3	4	5	6	7	8	9	10	11	12	13
°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
+30	+30	+27	+24	+21	+17	+13	+ 7	— 1	—11	—30	. .	. .	. .	. .
+35	+35	+32	+29	+26	+24	+20	+16	+11	+ 5	— 3	—17	. .	. .	. .
+40	+40	+37	+35	+32	+29	+26	+22	+18	+12	+10	+ 3	— 6	—22	. .
+45	+45	+43	+40	+38	+35	+32	+29	+25	+21	+17	+11	+ 4	— 7	—27
+50	+50	+48	+46	+43	+41	+38	+36	+33	+29	+26	+22	+17	+11	+ 3
+55	+55	+53	+51	+49	+47	+45	+42	+39	+36	+33	+30	+26	+22	+17
+60	+60	+58	+56	+54	+52	+50	+48	+46	+43	+41	+38	+35	+31	+28

The temperature which we feel is that of th bulb, that is, the evaporation temperature, for our are evaporating water just as the wrapping of th bulb is doing. A little practice in watching the mometers and consulting relative humidity table convince of the truth of this.

A room occupied by many people becomes satt with moisture from the breath and bodies of the in and the stifling sensation is very oppressive. A c of air to carry away this moisture is essential to fort. Just what is the physiological effect of the tion of this moisture upon the body, the scientific has not decided, but it is agreed that it is bad effect in weakening the system is shown in the fac so many persons contract colds and pneumonia on ing from a crowded room to the dry air outside cold weather.

RELATIVE HUMIDITY

nce between Wet and Dry Bulb Thermometers

+10° to +100°

2	3	4	5	6	7	8	9	10	11	12	13
°	°	°	°	°	°	°	°	°	°	°	°
61	44	28	13	. .	. .	. .	. .	. .	. .	. .	. .
67	52	39	27	15	5	. .	. .	. .	. .	. .	. .
72	60	48	38	28	19	11	. .	. .	. .	. .	. .
77	67	59	48	41	32	26	18	10	. .	. .	. .
79	69	61	52	45	37	30	26	18	11	6	. .
80	71	63	56	48	42	35	30	24	19	14	10
83	75	67	60	54	48	42	37	32	27	23	19
85	77	71	64	59	53	48	43	38	34	30	26
86	79	73	68	62	57	53	48	44	40	36	33
87	81	76	70	66	61	57	52	48	45	41	38
88	83	78	73	68	64	60	56	52	49	45	42
90	84	79	75	71	67	63	59	56	52	49	46
90	85	81	76	72	69	65	61	58	55	52	49
90	86	82	78	74	70	67	64	61	58	55	52
91	87	83	79	75	72	69	66	63	60	57	54
91	88	84	80	76	73	70	67	64	62	59	56
92	88	85	81	78	75	72	69	66	63	61	58
92	89	85	82	79	76	73	70	68	65	62	60
93	89	86	83	80	77	74	71	69	66	64	62

ling of the wet bulb thermometer is found
and column, and the difference between the
dry bulb in the horizontal line at the top.
at the intersection of these columns is the
idity under the conditions at the time.
e is shortened to avoid confusion, but the
ay be consulted and may well be copied on a

card and hung up beside the humidity apparatu
Ward's "Meteorology.") account
Public sanitation is forced to take and places o
quality of air in cars, halls, schools, toget
ment where many people are crowded conf
where the wishes of one individual may
the inclination of others.
The same methods may be used in the sing
The air in this should be even more closely look
for one stays many hours in a house.
Dust in the air causes irritation of the air
if nothing more, and such furnishings of the h
such care of them and of the floors should b
as will allow clean air to breathe.
The condition of growing plants is one of
best tests of room or house sanitation. If th
become very dusty, then the room is not clea
erly; if they drop their leaves, then there is p
gas leak or furnace gas escapes. If they do
they are not rightly watered, that is, if they
properly potted. Pots for the dry air of
should not be of the porous kind used in the da
house. If the common brown earth pot is oil
outside and then shellaced, it will be much
the plant and much neater and cleaner to har
roots that go to the edge will not dry up and
will not be cooled by evaporation. Roots a
leaves must breathe, therefore porous draina
plied at the bottom. Where plants will not gr
ought not to live, is a safe maxim.

For the country house, clean soil and clean

ficult to secure. Because the living earth or
so abundant in the surface—two to four
rdinary "garden soil"—sweetens and dis-
iciently of waste matter buried there, it is
verdosing or continuous use and thus be-
nd a menace to the house dwellers. More-
ul soil pollutes the water in the vicinity, so
ten than not, the well at a country house,
and clear the water, is unsafe to use. This
he case when there is a supply of water in
l a cesspool to receive the waste, or when
lowed to make a wet pool within fifty feet
To have things handy is not always safe.
ole on which earth purification takes place
it with air continuously or intermittently.
compose the waste matters under all nat-
l nitrate, carbon dioxide, etc., must have
e air. Therefore the soil must be porous,
pail of dirty water may be thrown with
e same spot each morning for twenty
takes it up within five or ten minutes,
clayey, so that the water stands half a
s is wet even the next morning, then
not take place. A small plot of sandy
of the drainage of a house, if it is used
ns, and if trees such as apples or wil-
the edge. Some crops may be grown,
e fruit is far enough above the surface
nage water. Since most germs, how-
drying in the sunlight, there is little

from an irrigation garden.
is in constant motion toward lc
the so-called water table is not
Herein is the cause of so man
of wells and cesspools and barn
of surface and water level dc

Clean water from shallow wells is a
porous and rocks are full of crevices, s
thrown onto the surface finds its way
down to the water level. Human beings
nitrogenous substances that are soluble anc
ing their way into the water, are carried wit
it goes. If they are found in any consider
it means that the water is not above reproach
be so well filtered that there is no real dange

It is about as dangerous for the ordinary p
out experience to attempt to interpret the re
water analysis as for an ordinary person to int
indications of a serious illness. The diagnosis
ious disease and the diagnosis of the history ar
tions of an unsafe water belong to the experi
not only knowledge but experience. To the layı
pearance and taste govern his judgment. Neith
criterion of safe water. The soft, slightly yellow
supplied by many cities is shunned by visitors
from sentiment. The meadow tea, as Thoreau
called it, is quite harmless.

Not all clean water is colorless. Not all clear, sl
ling water is clean. Not all pond water is danger
Not all well or spring water is safe.

Water carries whatever gets into it unless it is

hings go through all but the finest

re thrown on the ground, the water
il, leaving the cabbage leaves behind,
lt from the corned beef or the ice
s can be traced into the stream or the
line of flow, probably that is all that
t chamber slops are all liquid and sink
und; the chlorine goes through as in
but the ammoniacal salts become food
f trees, and finally, as oxidized nitrates
), the nitrogen passes on into river or
be readily detected and serve to indicate
e drainage.

is that the cesspool overflow or seepage
l filtered and that some bacteria may go
)me disease germs also. Too great care
:n to have clean water above suspicion;
f there is doubt.

.house well should be the best in town, but
:n the worst. (Only very general tests will
he end of the chapter, for most of the water
, require the diagnosis of an expert.)

:an air and clean water come clean fingers.
ight seem as if this were hygiene, a personal
care of feet or teeth, but it is much more.
:lean doors and desks and banisters, dainty
the use of fingers, never touching nose or
t means soap and water and towels, a nail
manicure scissors. It means careful washing
after touching the hair, which collects dust

rapidly. It means cleaning of shoes in a basement p
provided, and a brushing of clothes.

Sanitary cleanliness means washable or clear
clothes. Clothes would keep clean much longer if
gers were not wiped on them, and if they were
fully hung up and brushed. Lint from unbrushed w
clothing collects dust and then, when damp, smells.

Illustrative Experiments

To make a chamber for air experiments

Find a box at the grocer's about 16 x 18 x 6 i
Get from the glazier's 2 panes of common glass;
glass front and back, the front pane to slide up and
fairly readily. It need not be air-tight, no room e
Then make holes in the two sides with a 1½-inch
and use corks to stop the holes. If there is a r
training shop at hand the room may be made with
spaces like windows and sliding shutters. The id
secure a closed space of not more than a cub
content in which, without too much time, a class r
the candles go out, and watch the smoke indicat
currents.

To test air currents with a candle flam

A current of 1 foot a second velocity does n
ceptibly deflect the flame.

One and one-half to 2 feet deflects the flame
Four feet a second deflects it 45°.
Six feet a second deflects it 60°.
To change the air five times an hour in

porcelain dish and set on a brick or on sc
will not scorch or crack with the heat. 1
weigh the lump and add the calcula
water.

Ten grams CaO 40+16=56 requires
to make CaH_2O_2 40+2+32=74 grams.

If weights are not made, add at least ar
water to the quicklime. It should begin
swell up and soon fall to a dry powder, if
quick and the proportions correct. The ex
evaporates.

Drop the powder into the stock bottle,
four-fifths fill the bottle. A lump weighi
will serve for a 2-liter bottle.

Stopper lightly and shake at intervals
hours, allow to settle clear, then fit the sto
livery tubes. The appearance of a scum or
on any part of the solution shows leakage of

To prepare a one one-hundredth satura
measure 1 or 2 or more liters of water int
size of bottle is chosen, add 2 c.c. of the indica
phthalein) solution for each liter, add cautiou
water, finally, drop by drop, with rotary shaki
solution shows a faint color against a white b
remaining for 5 minutes, then add from the l
10 c.c. of the saturated lime water, stopper q
well, and place on the shelf with the delivery
as with the solution having the powder at t
This being clear, no time for settling is requ
other strengths are made in the same way,
smaller amounts; only the one one-thousand

one-hundredth. The two hundredth for the common tests: Wolpert, Fitz Appleyard, and for the ounce bottle -thousandth is used for what may be method, because a stronger solution much time.

ilute lime water tests the results are and comparative because of the great ding air at all points in the process.

eady method for estimating the carbon of inclosed spaces is a great desider- rties of the gas and its relation to other not, hitherto, admitted of a mechanical ermometer is a measure of the degree

plan of a bead of liquid flowing down for a day or two. But the thread soon d and ceases to conduct the liquid, and uires renewing frequently.

e of the Wolpert tester and the Fitz 10 c.c. of the dilute lime water in the tube is added successively measured vol- ich are shaken up with the lime water ed of the CO_2 until the solution is neu- becomes colorless and cloudy with the n carbonate.

or air takes 300 c.c. to decolorize the ter, and if the air in schoolroom A takes schoolroom B 100 c.c., and in a bedroom e have a relative measure of the badness is necessary to test the lime solution in e sure of the method and results.

Of a one two-hundredth solution 10 c.c. w
350 to 350 c.c. of outdoor air to decolorize; a
ventilated room, 150 to 200 c.c.; a badly venti
100 to 150 c.c.; an intolerable and quickly to
room, 50 to 90 c.c.

A set of graded bottles, 2, 4, 6, 8, 1
bought of the druggist, may be filled with
ried to the place to be tested and the water
The air will rush in to take its place and thu
The 2-ounce bottle corresponds to the 50
4-ounce to the 100 to 150 c.c., the 6-ounce
200 c.c., the 8-ounce to 200 to 300 c.c., t
300 to 400 c.c., when the above solution is
shaken.

The same solution may be used for t
The principle of this is that the highe
of CO_2 in the air the quicker it will ur
water.[1] Select some white glass 500
or square or oblong, not corrugated
stoppered; wash them thoroughly, soa
little acid in the water to neutralize a
the stoppers. Collect air samples by
from the inverted bottle held at the l
tested (catch the water in a suitable
to refill the bottle if more convenier

When the desired number of s
lected, bring to the laboratory, add
hundredth solution, close the bottle
time to the second when the lime
the color has nearly disappeared

[1] See any text-book for law of partial

minutes, the ventilated room 2 minutes,
ted room 1 minute, the intolerable room
s.

le method the one one-thousandth solu-
a test tube fitted with stopper and glass
he air is drawn through slowly and its
of the CO_2 as it passes. As the time
is can be passed only slowly and in small
n only comparative, but for a lecture ex-
llustration of progressive pollution it is
Fresh air takes 10 minutes, fairly good
d air decolorizes in 2 or 3 minutes. If
lable it may be produced from a pair of
rators, so connected that the water from
other at a lower level, and when full the
ersed.

HUMIDITY TESTS

stifling sensation of saturated air and
emperature, or that which we *feel,* is
ılb, use a small room or closet, which
st by hanging wet blankets or moist
set a pupil to record the sensations and
instruments.[1]

RIMENTS WITH WATER

sible to find a bottle holding 2 to 4
om broken off evenly, or to have one
me convenient manner; fit the neck
ing a glass tube furnished with rub-

[1] ave a Draper registering thermometer it will
nstruction.

ending and punch cork. Fill
he sample of soil to be tested, put a
ottom and some coarser gravel
drainage, then the sifted earth. I
to Weigh the dried earth used and
Water added at the top and note
from different sources will take
for contrast should be obtained.

(*a*) Prepare test solutions as
gram salt (pure, dry NaCl). Make
0.001 gram Cl.

(*b*) Weigh 0.072 gram KnO_3.
Measure out 100 c.c. of this and
1 c.c. = 0.000001 nitrogen.

(*c*) Weigh 0.315 gram NH_4
liter. Measure out 100 c.c. of t
a liter. 1 c.c. = 0.00001 nitrogen.

It is desirable to prepare fresh

(*d*) A solution containing 1 c.
liter.

(*e*) A solution containing 1 c.c

Varying quantities of these sol
them may be made by the class, e
and tests of the filtrate made. Th
following facts: That the salt go
whatever the mixture used, and
for chlorine is a universal one, a
the normal for the region is a ce
pollution. That passed through
nitrates go through unchanged;
of considerable organic matter,

ce, they are reduced to nitrites. Ammonia and
e solutions may be converted into nitrates by slow
age through unsterilized loam or garden soil, but
are not changed by clean washed sand. Nitrates
efore show a previous contamination, ammonia and
ites show present contamination.

Filtration after Coagulation

Mixtures of *d* and *e* in considerable dilution with a
e clayey soil may be used to illustrate the purification
mechanical filtration, now so common for the muddy
r waters of the South and West. To 1 liter of the
l water add 1 to 10 c.c. of an alum solution, 5 grams
he liter; mix well. If on standing half an hour coag-
ion does not take place, add 10 c.c. of a saturated
e water, mix well and allow to stand. Experiment
adding first one and then the other until it is probable
t 24 hours' standing will give a clear solution which
y be decanted. A much less quantity of the reagent
l give a mixture which, run through one of the pre-
ed filters, will give a clear solution.
The hard waters of the South and West will coagu-
without the addition of anything beside the alum
ution. The soft colored waters do not contain enough
e or sodium salts to decompose the aluminum sulphate,
l some must be added.

Examination of Well Water

Secure from the chemical laboratory a small bottle
Nessler solution to test for ammonia; neutral potas-
n chromate to use as indicator for chlorine titration;

raporate 2 c.c. of each of the water sam-
chlorine just to dryness on a warm bath

porcelain dishes are best. Add 5 drops
l phenol disulphonic acid, moisten the dish
/ater has dried, and neutralize the acid by
lkaline solution of potassium hydrate. If
:es a yellow color will appear more or less

polluted well which shows free ammonia,
listilled water almost always contains am-
:rated in its distillation, hence there must
in making this test. Well-filtered ground
t show ammonia.
ıese things are in themselves harmful, but
certain underground happenings which are
l.

ing into any extensive discussion of these
eacher should read some of the text-books

CHAPTER I

HABITS OF CLEANLI

"Correct habits, not rules, are the I
all sorts of defects." — *Saxon saying.*

"A most essential part of modern e
formation of such habits with regard to
conduce to the best living."

HEALTH, like religion, is to
part of the individual as to be
and not a matter of times and seaso
When this is the case, the perso1
become as much a part of him—a
formed—as breathing. Such habits
pressed on the body while it is p
that is, while it is young. But the
with difficulty and by much thou
Hence there is the greatest economy
in accustoming young people to ha
which will give them the best chan
chance to be healthy, happy, and effi
Grown people find it such an effo
that curious devices are resorted to
doing what they agree is right and
it takes an effort to remember to d
An excellent example of bondage
out in the proposition that was a
change the clocks of an island tow

breakfasting three or four hours after the
quirrels, the people may be up at five or six
enjoy the best of the summer days.
ıstrates the purely mental effect of going by
id not by what is wise and desirable. An in-
mmunity has not strength of mind or energy
take the great sanitary advantage of the life-
ly hours without being inveigled into doing
e clocks.

t becoming frightened by a discussion of
may well ask where do microbes come from?
ıem in dirt and refuse and wherever there is
ıem. They act as decomposing agents to make
matter into food for plants as soon as possi-
and animals eat the plants, and other microbes
he cycle.

thrown out on the cornfield or buried in soil
mes absorbed, but the same refuse hidden in
ard under a pile of boards where nothing green
may become dangerous and will be offensive.
nisms which work in the dark and often make
s are called anaërobic, without air. Rout them
the sunlight and air and they soon die. In the
is nothing to do but to get rid of them, down
as quickly as possible, if they are liquids or
r and to burn all coarse solids.
s; ow does it happen that there is so much dirt to
? Why must we be on the lookout all the time?
y because we are careless and thoughtless and
se about to be looked after by the microbes,
doing their best to help us.

That is, we have not acquired g
ness—never to leave wastes about, b
for good and all as soon as possible
These habits will become second
we will take pains for a little time.
a short time, then our habits will tak
and we can think of other things.
We have certain inherent capa
strength, length of life, etc., but it li
selves to adopt a mode of life which
difference in height, weight and p
intellectual capacity. An eminent
"most people die prematurely throu
to infection, improper food, excess
air, diet of various kinds, unheal
proper clothing," etc.
These essential habits are larg
breathing, eating, and drinking (air
together with sleep, exercise, and cle
Every man who hopes to make a
work—whatever that may prove to
the habit of forming good habits, of ta
habitually to fashion his character in t
If heredity has hampered one's life,
more desirable that the one who has litt
should acquire habits of doing the ri
husbanding both physical strength and
"Even inanimate things acquire hab
better after being used some time; it
to fold a paper when it has been fold
saving of trouble is due to the essentia

it about that to reproduce the effect once
amount of the cause is required. The
olin improve by use in the hands of an able
the fibers of the wood at last contract habits
onformed to harmonious relations. This is
such inestimable value to musical instru-
ave belonged to great masters."
ate things can acquire desirable habits of
world, shall human beings not take pains
iselves of as much value as possible at as
nervous energy as may be? For it is cer-
at "habit diminishes the conscious attention
:ts are performed."
may involuntarily and without effort do the
: the right time, *leaving the mind free to*
natters requiring higher thought. If prac-
nake perfect, nor habit economize the ex-
'ous and muscular energy, man with his
mpulses to action would be in a sorry

nd youth learn so easily and adults with
that the plan of education should include
:s which make for long life and immunity
"The more of the details of our daily life
ver to the effortless custody of automatism,
higher powers of mind will be set free for
per work." "Could the young but realize
y will become mere walking bundles of
uld give more heed to their conduct while
te."[2]

nont, Essay on Habit, *Revue Philosophie*, Vol. 1, p. 324.
ychology," pp. 122–127.

Whenever the sanitary enthusia
take more pains to do certain rigl
certain doubtful ones he is met w
"I cannot remember," "It takes too
much trouble to think of that," etc.

Right sanitary actions should n
thought. They should be done i
the effort of thinking.

Professor James's two importar
"Make our nervous system our ally i
—make automatic and habitual, as
many useful actions as we can."

(2) "Never suffer an exception
new habit is securely rooted in your l
costly to learn by our mistakes than
of right ways which soon become ur

The habits to be contracted early
and social, the reasons are explained
sonal hygiene and in those on con
At this point only a general survey
concerning personal hygiene are for t
datory, as bathe daily, clean the teeth
and on rising and going to bed, etc.

One of the most important habits
of keeping one's fingers and all other o
from nose and mouth. Then the han
dangerous. This fingering of the face
of savage days.

Eyes and nose are subject to disord
infective power, and hands transmit to
objects handled by others. That is w

into a consideration of community

modern knowledge one of the bad
: finger to turn the leaves of books.
he leaf and causes it to turn yellow,
h harbors many kinds of dormant
rous proceeding as well as an untidy

how few people have outgrown the
ng things in the mouth. "Out of the
ıcleanness." This habit is not a little
ead of children's diseases and for all
agreeable home in nose and throat.
ng an apple and then handing it to a
pernicious.
to free air or into your hand. The
ɔeaking, when there is mucus in the
ılly is sent for a number of feet away
hat is why grip and tonsilitis spread
:d shops and cars.
ıes this spray it stops it, to be sure,
friend's hand or to the book or bag
se a handkerchief or piece of cloth
:nty of them.
e greatest pains should be taken to
d finger nails really clean, not just
Washable glóves put on when the
a protection against others' care-

ooks, chairs, banisters, coats, etc.,
n and wipe them on a clean towel.
ı the worst carrier of infection.

Daintiness in these respects is portant habits to form. Cheese clot of towels and may be washed an premises. Ironing is not necessar

Another very necessary habit is kerchiefs. No matter how inex cloths of some kind should be used and therefore they should be lar should be enough of them to preve is wet or soiled.

There are more sanitary sins c nection with lack of sufficient hai any other one thing except, possibly

The spread of the deadly spina pretty clearly traced in several c were carrying sick children lendin chief to the next child.

The mothers will sigh over handkerchiefs and towels, but right for wiping desks or boots) such a will more than pay in good health

The habits affecting community prohibitive. Do *not* spit in the st the public paths, because it may inf about with dirty hands and finger may your own body suffer from by means of scratches, but you and others' property, and may organisms.

The tendency to get rid of wa trouble to one's self and without t

s seen in the sweeping of houses, halls,
ıe streets, in the throwing of papers and
under seats in public parks, and in the
ınut shells in cars. No surer test of the
intelligence of a community can be made
tion of a suburban train, both as to its
cleanliness. The public carrier and the
r take pains only to the point demanded
atronizing them. The grocery store has
his demand. Have the schoolhouse and
l post office in your vicinity so responded?
:ercise for a class will be to make out a
from their studies and from observation
ocalities. The country school will have
uburban another, and the city school a
ıy variations.

the way for a study of the next chapter.
ımunity to do in order to demand right
from itself, namely, the making of rules
which mean the acquirement of habitual
things of the most advantage to the com-

›f putting wastes in a proper place pre-
kind is one of the most valuable sanitary

be enforced in school. The schoolhouse
should be the example of tidiness. It
:w seconds for each one to do the right
tion for paying public scavengers is light-
from distributed dirt insured.
clothes is a sanitary problem.

Loosely woven wool is the warmest coveri
lects the most dust and is most difficult to was
woven cotton or silk is next best but soon lo
look and becomes limp and twisted.

Finely woven cotton or linen holds its
shape best under hard usage, sheds dust
easily, but conducts heat rapidly and is not
cold weather.

Under the conditions under which city cl
dusty streets, dirty cars and staircases, crov
and sooty air—clothes should be frequei
stockings especially. In the city, water is
there is no excuse for not keeping clean.

Illustrative Experiments

Tests for Cleanness. Dust on

In the Navy the inspector wipes the ins
kettle with a fine cambric handkerchief.
tion of the immaculately clean linen shou
all furniture may be kept in such order, t
mation may be made.

Have several squares of fine bleach
six or eight inches square. Test desks
tables, window sills, door handles, banist
if they are free from black dirt. The
take up even more than the cloth.

For the dampened duster see page 5

Flies are tabooed; but if the windov
cloth moistened with a little alcohol may

done not only for neatness, but as a since flyspecks may distribute disease squares in a pail of water at once, convenient.

vention is half the battle. Do not oes and clothing. Unless windows air is forced in through a screened blow in, if the house is on a street field. Hang a large piece of the oth across the opened window, pin- e air must pass through it and leave ote the time when it becomes dark- egins to bag out, showing that it is same before the ventilating inlet. is one of the best agents for taking wood floor. It may be burned and sed of. Bits of dampened, not wet, t best, and for the same reason. tened to a broom or bristle brush

is been cleaned, expose Petri dishes r and set aside for 48 hours. If the ist half an hour after cleaning, it is if there are not more than five or

EXERCISES

ur hands so clean that the water in washing?

uching walls and banisters, chairs rily?

Habits of Cleanlin

Do you notice dirt on your hand
Do you keep your mouth closec
places?

Do you refrain from putting pen
into your mouth?

Do you refrain from wetting
leaves?

Do you keep your hands dry
gather dirt?

Do you breathe deeply without

Do you notice stuffy air?

Do you do your part toward a
and avoid throwing papers, etc.,
proper receptacles?

Do you avoid spitting?

Do you avoid coughing into the

Don'ts:

Don't live in foul air.

Don't drink impure water.

Don't buy dirty milk.

Don't use stale milk.

Don't eat food badly cooked. T
somewhere.

Don't kiss dirty children.

Don't mouth dirty money.

Don't fail to wash your hands o

Don't rub your eyes with dirty f

Don't forget to put the shovel o
down the privy vault in the coun
from the cat.

Don't throw apple cores and banana skins out for the
to breed in.
Don't leave the water in the flower vase more than
ve hours.
Don't forget to wash and scrub your hands after
h.
Don't wipe your hands on your clothes.

CHAPTER V

SANITARY REGULATIONS

"Within the past few years the knowled
of disease has become so far advanced that
practical certainty that by unstinted appli
methods of investigation, and consequent c
all epidemic disease could be abolished within
as fifty years. It is merely the employme
at our command.

"Where there is one man of first-rate
ployed in detecting the disease-producing
special conditions of life, and the way to l
end, there should be a thousand. It shoul
purpose of civilized governments to protect
this respect as it is to provide defence again
sion. . . . The masses of the people are not
situation. . . . It is certain that democracy
the authorities] shall put into practice the
control which has been gained by mankin
every sinew to obtain more."

—*E. Ray Lankaster, in "The K*

THE educational effect of legal e
forcement none should know
officers. But it is also painfully ev
whose hands lies the enforcement of
this education has not gone very f
that year after year the same sort
done as if it had never been done
intelligent masses rebel against the
understand and evade all that they fi

ing back the sea with a broom, since
fresh contingent of ignorance. A re-
r of the law is inculcated by the en-
ordinance against spitting in public
o permanent cure for the evil habit
til the children and young loafers also
reasons why it is dangerous.
nts and children understand the rea-
the streets and garbage in the back
tolerated, it will continue to be found
/ ordinances and health officers.
ions are of little value unless they
and obeyed, and to be obeyed cheer-
nderstood.
r should have certain regulations for
citizens.
lso laws in relation to the protection
l cases as affect a wider community.
piled in manuals which may be ob-

leral government has regulations
istance travel, imported goods, etc.
ld have copies of these laws in its
f their existence should be called to
pupil, even if they are not read

protection and not for our oppres-
are ignorant and selfish we shall
ghbor in our careless and ignorant
ht to claim government protection

Sanitary Regulations

Many of these regulations seem at first sight
ive and unnecessarily costly, but in the long r
will be found to be as fair as they can be made.

Injurious Trades and Factory Inspectio

Two great enemies of indoor workers ar
and dust, gritty or linty or poison fumes. F
ual carelessness and unclean habits make da
handling of such materials as lead, paint,
products.

Factory inspection includes inspection o
floors, toilet accommodations, and most of
environment; but instruction of the workers
part in co-operating to maintain a sanitary
too often lacking.

In most of the dangerous trades, helps
which the workers are too lazy to use. San
tion must go so deeply into the daily lives
that nothing will seem too much trouble
means, health and capacity for work may

Inspection

Tenement inspection shows the same la
to laws of health. School inspection is
supplemented by the work of the schoo
really a teacher. All inspection should
in this way by practical instruction in the
ing out the regulations. All rules, hc
drawn, will fail to meet exceptional ci
intelligence must take into account the f
ciples.

Education

e has advanced so much faster than
e that many communities get their
entive measures only after they are
ı epidemic.

ıe New Orleans epidemic of yellow
. point. Although the suppression of
uba was the most remarkable result
r seen of the application of scientific
ediate beneficent result, the officials of
l not fully accept the mosquito theory
suppress the trouble in the beginning.
sence of the United States authorities
es and ward meetings to educate even
ıle to the true remedies.

nitary matters, knowledge of what are
and a belief that such precautions *pay*
carried on day by day—must be the
or human progress.

ı which an epidemic was the costly
camps of the United States soldiers
panish War in 1898. Typhoid fever
the camps situated in the Southern
:h an extent that more than one-fifth
, and it was brought away to an ex-
ork of twenty years in suppressing
r cent. of the officers contracted the
lusively proved (to our everlasting
e the chief carriers of the disease.
only because the precaution of cov-
: the excreta was not attended to.

Sanitary Regulations

There should not have been flies to carry the first case should have been the last.[1]

The plague of flies may be stopped places are screened, as manure heaps when streets and alleys are kept clean when restaurant and house garbage is in short, when nothing is left about for fl

Let us protect all foods from flies. cannot or will not prevent their propa viduals must resort to fly paper, insect sional fumigation.

Official Public Health W

At Washington, D. C., Surgeon-G is in charge of the Public Health an service under the Treasury Departme Laboratory carries on researches a Conferences of state and territorial held in Washington.

All the states have Boards of H the state capitol. Many of them is interest and value which may be ob or through representatives.

Several of these boards issue bu for free distribution, notably Mai

[1] Walter Reed, Victor C. Vaughan, E. the Origin and Spread of Typhoid Fever ing the Spanish War of 1898." Dr. L. O. Howard, "A Contribution Fauna of Human Excrement." Proceedi emy of Sciences, Vol. II. Governme

[2] W. E. Britton Donn, State Entom Fly in Its Relation to the Public H January, 1906.

ɔut, New Jersey, New York, Ohio,
ɔwa, Wisconsin. Michigan has for
ıuch attention to the dissemination of
n sanitary topics. A series of teach-
ing a circulation of over a quarter of
ı issued since 1895 to enable them to
/ of that year requiring instruction to
ın to contagious diseases and other
ıe of these gives an interesting esti-
value of health work.

e information, well-equipped labora-
g installed, with a corps of investiga-
ɔrkers. Visit that in the locality of
le.

ːes a surprising amount of informa-
bulletins and reports is being issued,
ıe has no excuse for ignorance.

of Health of New Hampshire issued
Bulletin for gratuitous distribution
e on scarlet fever, "in order that a
ːneral knowledge of the means and
to the restriction and prevention of
ɛ disseminated."

ɔntclair, N. J., has been a model for
The 1906 report says:

ɜ have been directed, as in former
ɛnting the spread of communicable
to prevent the spread of disease

r control of persons suffering with
ɜ, including their environments.

"(2) In safeguarding the milk sup
"(3) In constant watchfulness ov
buildings of the public and the paroc
"The oversight of the milk supply
important if not *the* most importar
which is intrusted to a Board of He
Comparatively few householders
requires until they come in contact
ment dweller and the recent immigr
of the best ways of keeping clean in
Instructive nursing has found its
inspection should be introduced in
school and the Woman's Club can e
coming a source of information and
best appliances. There should be
women inspectors in each town and
In 1905, Prof. J. Pease Norton,
Economics, Yale University, prese
American Association for the Adv
in which he gave statistics to back
ernment attention to the great wa
preventable disease. He claimed t
living over eight millions would d
during the next ten years more t
fants under two years would die;
ish of pneumonia, six millions f
diseases. Of these twenty-eight
potential value of $5,000 each,
a tremendous money waste is gc
prevented by an expenditure of
the amount in money and a litt

A committee of one hundred has been or-
/ork for public enlightenment and for a public
sulting in government aid.
t effort had already started under the name
ı Education League,[1] whose work is the cir-
ooklets giving an epitome of the practical
ı certain definite points. There is little
for any one to go ignorant of the various
be taken to ward off disease.
: of Connecticut there is a woman deputy
ɔr, recommended to the factory inspector
n of three women appointed by the gov-
:puty is to consider whatever relates to
velfare of the 50,000 working women in
includes inspection of sanitary fixtures,
lation, etc.
undation of state medicine—the protec-
ant, the helpless, and the thoughtless.
ıcher allows the schoolhouse to become
e it does not seem important in com-
lessons; many a shop manager never
d many a tenement owner says, "Oh,
hire it"; or, "They do not want any
law steps in and says, "But they
and if they are to become good citi-
ɔrkers they must have better."
his education through sanitary regu-
of New York, Texas, Pennsylvania,
olumbia have each a Department of
e commissioner and county health

officers and inspectors. Massachuset
district inspectors.

Many states have milk commissio

All this effort to enforce the laws
instructing the people in safe ways o
daily life, for the laws are almost al
general belief concerning the necessi
instance, the city of New York has a p
tary code that all food in the streets
but it is not enforced because the gene
people is not ready for it.

Diseases that are carried by flies,
water, etc., and that are carried from
other by contact and by handling of
MAY BE PREVENTED.

WHY ARE THEY NOT PREVENTED?

Because the people do not believe t
health are necessary and they are not wi
trouble to follow them.

In the Panama Canal zone they col
and rubbish *every day;* even shavings,
barrels, the litter of house building, are
night and burned. No rubbish of any
to accumulate.

Large bodies of men are employed in
the zone keeping every pool of stagn
covered with crude petroleum. The bank
are constantly patrolled and every sma
water bay is filled up and all the work
careful inspection.

All this shows what might be done in
only believed it was worth while.

l they have come to feel that the great
e day is THE HEALTH OF THE PEOPLE,
formed a National League for physical
improvement.
ord Derby said sanitary instruction is of
mportant than sanitary legislation.
1 supersede the value of personal and pri-
ieve the public officers of so much duty as
)ut by individuals.

LLUSTRATIVE EXPERIMENTS

EXERCISE IN INSPECTION

loan of a house for inspection. Observe
alleys adjacent; watch for the water cart
the sanitary collector of ashes and gar-
the carts are covered; if the men take
:er or spill or drip; if they come as often
Note how often and how well the streets

h the gate, examine the back premises;
1 bottle or bent metal which can hold a
Ote if roof gutters leave pools; note any
for flies; note rubbish in general. Espe-
the garbage can; see if it is of light
may be cleaned on emptying. (If it is
ind and protected by a light frame and
the manner of the Stephenson, it keeps
become offensive.)
e that in tenement houses and small
all garbage receptacles shall be emp-

tied and cleaned each day. Some pu
must be obtained to force this upon care
If all is proved to be really clean ar
outside, pass to the area or basement do
space is damp. Enter the basement c
quickly from the outside air and observ
any kind of odor and its source—decay
or stuffy air. Follow into kitchen and
room, hall and chambers, or such of the
are. Show the friend how better ven
obtained by windows raised or lowere
cloth screens inserted or placed outsid
obtained, etc. Convince him that a li
"heat all outdoors" is cheaper than
doctor's bills.

At this point let the class discuss a
of regulations for their own town in th
have studied, such as would seem to
better sanitary conditions and not to
carry out either in regard to time or m

Then procure a copy of the Board
tions for the town and for the state and
see if anything has been omitted.

The class may prepare cards suitat
in schoolrooms, or one-page circulars
among the people, stating clearly and
things we do know and avoiding sens
reference to things we do not know.

Also the pupils should draw up ru
themselves, and once a week revise then
too stringent or too lax.

This kind of constructive exercise i

tain difficulties stand out prominently which
ise be overlooked.
of obtaining the requisite amount of fresh
l climate, and of maintaining the desired
leanliness in a place where labor is dear
ndant, should be brought out by concrete

er will find an excellent model in "A Hand-
Housekeepers of Chicago," pages 16-28.
nly those things to be done which are

N PREVENTION OF DECAY—ANTISEPTICS

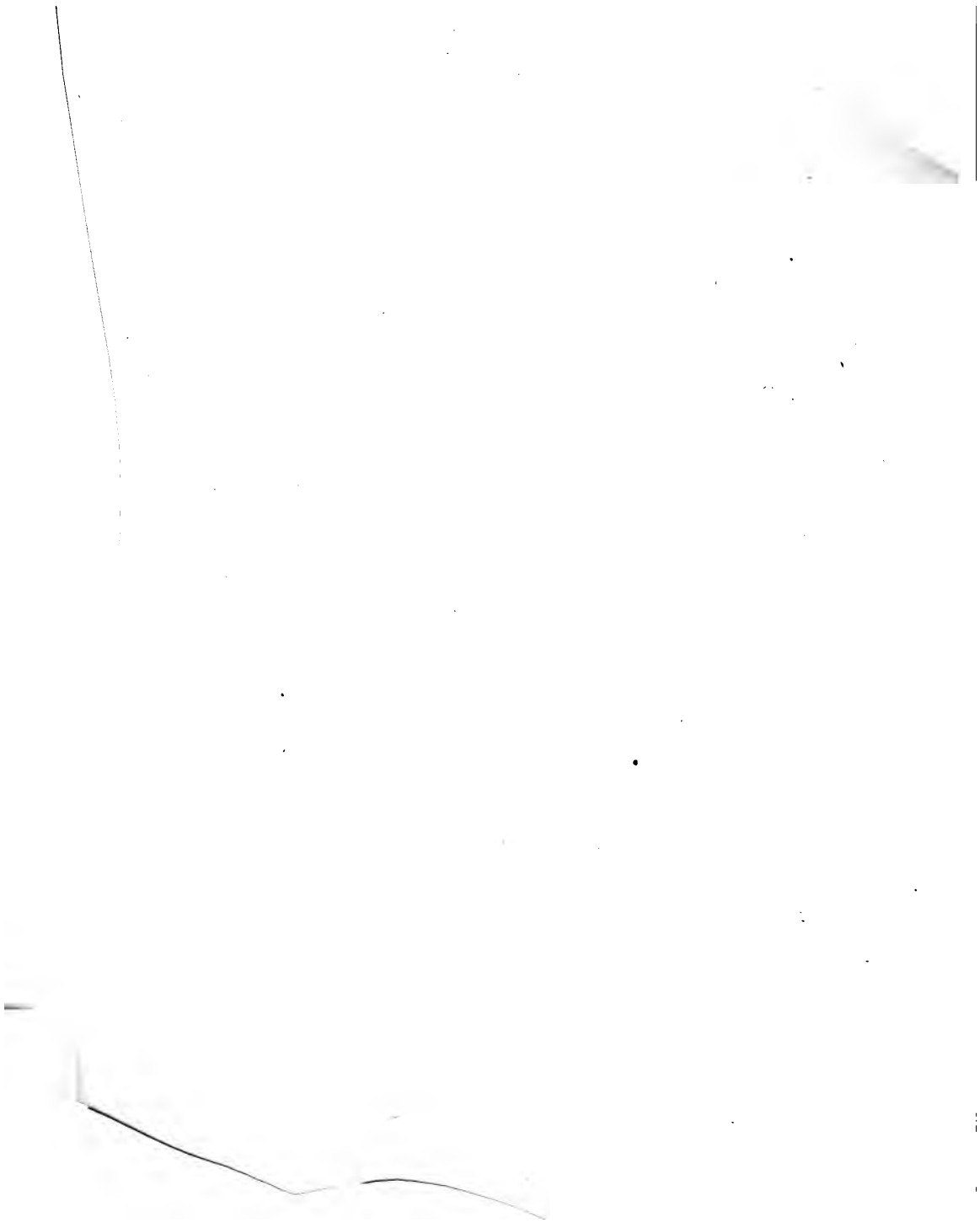
ll bits of meat in test tubes, in salt, alcohol,
formaldehyde.

ISINFECTION—STOPPAGE OF DECAY ALREADY
THAT NO FURTHER HARM MAY COME

broth which has been allowed to spoil in
small flasks, with heat, alcohol, formalde-
autiously), corrosive sublimate, sulpho-
l, etc., to see if decay is really stopped.

IN DESTRUCTION OF ORGANIC MATTER

lice of meat, say ¼ inch thick and ½ inch
g, into a thick earthen cup in the middle
ounded quicklime 1 inch deep under and
up must be deep enough to allow the
quicklime as it slakes and must be set
g will do no harm; cover and leave for
examine. Repeat with copperas, iron



CHAPTER VI

IMMUNITY. CONFIDENT LIFE. EUTHENICS

"If our corpuscles are weaker than the invading foes, no drugs can save us — we are doomed. Hence the importance of keeping our nerve centers well charged and our minute life cells in vigorous condition." — *Sidney H. Beard.*

The cultivation of sanitary tastes which will enable us instinctively to avoid unclean air, doubtful food, and dirty paths is as much a duty as the cultivation of a taste for beauty in form and color.

"We make them hope, and hope is health."
— *B. W. Richardson.*

IN every community some persons are constantly liable to disease, always ailing, while others go through epidemics unscathed. Common tradition attributes this immunity to some mysterious inherited property, just as little under control as the color of one's hair or the shape of one's nose.

It is true that a certain set of tendencies is inherited and that care in infancy is of extreme importance in the development of physical power; but the perfecting of the organization lies with the individual himself, chiefly as result of the habits just considered, together with th concerned more intimately with the individual per hygiene.

To be perfectly well is to be resistant to But the strong man is careless and may drink b

when he is tired or chilled, and have typhoid fever; may eat bad food, and be poisoned with ptomaines; may be sweated in bad air, and come down with pneumonia. These things the person sensitive to sanitary conditions will avoid, when one who takes no notice will not.

There is personal immunity, good physical condition; and mass immunity, good sanitary environment. The first is an individual matter, the second a collective social affair to be promoted by a consensus of opinion.

Fear is one of the most frequent causes of illness. Confidence in one's surroundings, in one's own good condition, is half the battle. How can one have confidence when the senses are offended at every step, in every hall and shop and car? How can one gain strength from food served in unclean vessels on unclean tables in rooms swarming with flies?

All conditions should be made right and then no one should worry.

Whatever may be the ultimate cause of immunity—whether the care of the body-soldiers of defense, the phagocytes, or whether it be opsonins, or just plain good blood—to feel fit to rise in the morning, ready for the day's work, without headache, with energy waiting to be used—that is confident life, that is the surest condition of immunity. A happy life enjoyment in work, whatever it may be, is the best safeguard against disease.

Proper diet belongs under personal hygiene, but communistic living may well come under the head of sanitation. It needs inspection and demands the services of a educated person.

In fact, the taking of food is as much a regulated

process as breathing or drinking. Life processes cannot go on without heat; and the union of the oxygen breathed in with the air, joined to food stuffs eaten and digested, furnishes this heat as well as energy for work.

It is not, then, a matter of whim, or of *like* or dislike. Each one of us must eat to live, to work or *play*, and the less we think about what we eat the better, provided that we start with good habits, or that some one who knows the right food sets it before us.

The boy or girl who expects to travel, to move about and see the world, should learn to eat all wholesome foods. One of the best assets in the Bank of Health is a strong appetite and a non-squeamish stomach. This organ can be strengthened or weakened like any other; like an arm, or the heart, it is susceptible to mental influences. That is why food comes into sanitation. It is as important to have right ideas on food as on air, for only then will sufficient effort be made to get the right kind and to have it clean and free from objection.

Market inspection of the strictest sort should be demanded in every state or city. The buyer cannot give the time to study with reagents and microscopes the bread and meat he purchases. Inspection is part of the city expense for which the individual householder pays taxes.

But in order not to make this an intolerable burden, each one should refrain from adding to the danger. The excrement or flesh of infected animals infects others, therefore the first law of sanitation is here also applicable—disposal of waste matter so that it will not infect others. We have yet to learn that this must be thor-

ghly done. All diseased meat should be steam treated l the excrement from diseased animals sterilized. ese dangers will come in country towns rather than in es, for the countryman is obliged to look after his own mises.

Fruit is praised as most healthful food, but the half en or half decayed stuff exposed for sale, especially he country village, a little out from cities, should be ied out of sight rather than eaten. As in all the other jects treated, standards should be learned so that it be easy to avoid the dangerous product. Standard lity will of course have its price, but will be better th it. In cities much sickness comes from eating ayed fruit and dirty fruit.

Avoid taking a winter diet in summer. First, because needless to force the body to manufacture heat to w off by water (evaporated perspiration); second, use much of the food becomes uncertain, if not dan- us, in quality during the hot, damp weather. All s decay more quickly under such conditions. Left- s may be unsafe and all minces and croquettes are to oked upon with suspicion in the ordinary restaurant boarding house, especially in hot weather. Even s subject to the same suspicion. In fact, it is today f the most difficult viands to secure in excellent on.

itation in relation to food deals first with whole- nd clean materials—meat from animals free from fruit and vegetables free from decay, milk, butter, e from contained bacteria. The dangers are the ence to the human body of encysted organisms

trichina, of the absorption of poisonous substances,
ptomaines; of the lodgment of germs of disease
with dust on berries, rough peach skins, crushed
fruits; of the dirt clinging to lettuce, celery, and
vegetables as are eaten raw.

For the next class of dangers, we turn to the handling of foods with unclean hands, or the dripping of infected matter over clean clams or oysters. It is a safe precaution to patronize only those restaurants in which the waiters are evidently trained to handle the food and vessels with care. The mouth habit is so universal that it will take years of calling attention to it before girls can be broken of the habit of wetting their fingers and smoothing their hair. Not even the waitress' cap can prevent this very unsanitary habit. Boys have a correspondingly bad habit of wiping their hands on their trousers.

In these and countless other ways disease is mysteriously spread, all due to uncleanly habits. It will pay well to take care of one's hands and learn sanitary habits when one is young, then one will do right without effort. Whatever change of ideas may come with increase of knowledge, these habits will not need to be unlearned. Without knowing the reasons, they have been proclaimed in civilized lands.

All evils and dangers cannot be eliminated, therefore we cultivate immunity, not carelessness, but that degree of good blood which can easily care for stray germs that get in. This good blood cannot be made without good air. Good food is necessary, but oxygen is *essential*, and for this reason air comes first in the study of the means for the best of health.

We have one very bad habit which comes from an erroneous notion—the habit of going to the fire or putting on more clothes if we feel chilly.

That feeling is due to slow circulation of the blood, often because it has become too thick or too loaded with waste products. The remedy is a glass of hot water or a little brisk exercise; usually both are best.

If chilly, do not eat until warmed by a brisk walk about the square, or by light gymnastics. Every one should be trained to do three-minute exercises to start the circulation, "appetite exercise," it may be called. One or two glasses of water as hot as can be taken, plain water is best, colored by tea may serve, or hot milk may be taken if some time before a meal. It is the quickened circulation that is of value, to bring enough oxygen to the food to be used.

There is one phase of immunity which it is well for the teacher to keep in mind—that of inoculation, as for smallpox, by vaccination. There seems to be a sort of self-inoculation which prevents further trouble, as in the case of ordinary mosquito or flea bites. The first few days many persons suffer greatly, but soon become immune. Whether the blood develops an antitoxin or what happens is not certainly known. We become accustomed to certain conditions, and so tolerate them, but this belongs to another department and is only mentioned here because this indifference of some people living under the same conditions as others who are sensitive is often a strong argument brought up against all sanitary measures intended to include the community.

We were not poisoned by the water, or by the flies;

Immunity. *Confident Life.*

why should we clean up so that these strangers can live here?

Communities have accepted a degenerate life and laid it to the climate, when it is now known to be caused by some parasite, as the famous hook worm disease in the South and in tropical regions. The people lived a bare existence because of the prey of the disease, and went on scattering it wherever they went. Luckily they were no great travelers.

Rules of Safety

Since diseases are most frequently conveyed by actual contact with persons or with fresh body wastes, sputum, excreta, etc., it is safest to treat all body wastes as possibly dangerous, to avoid contact with them, and to dispose of them as soon and as completely as possible. Town authorities should demand isolation of all infectious cases.

Since dust in the air is always irritating to the delicate mucous membrane of nose, throat, and lungs, and thus is a cause of receptive condition for attack; and since objectionable organisms are frequently carried with other particles in the form of dust, it is safest to dispense with dust.

Since dust on furniture and floors is harmless so long as undisturbed, it is safest to remove it without sending it into the air to be breathed again. A dampened cloth should wipe it up, not a feather duster or dry cloth, sure to distribute it into the air again.

Since water and milk are frequent carriers of disease, both should be under sanitary control, and the community should pay cheerfully the price of clean supplies.

Since produce is brought from long distances and exposed for considerable time, markets should be under careful inspection and buyers should inform themselves in regard to the cleanliness and care with which all food materials are stored and handled. This will apply to one's own kitchen and pantry.

Since all wastes may harbor unpleasant and possibly dangerous agents of decay, they should be completely disposed of as soon as possible; not redistributed in small quantities, but burned or buried beyond recovery by prowling curs or rats.

Since the best preventives of germ growth are *sun*light or cold below 55°, secure as much of the first as possible, and keep all perishable foods below this *temperature* until cooked.

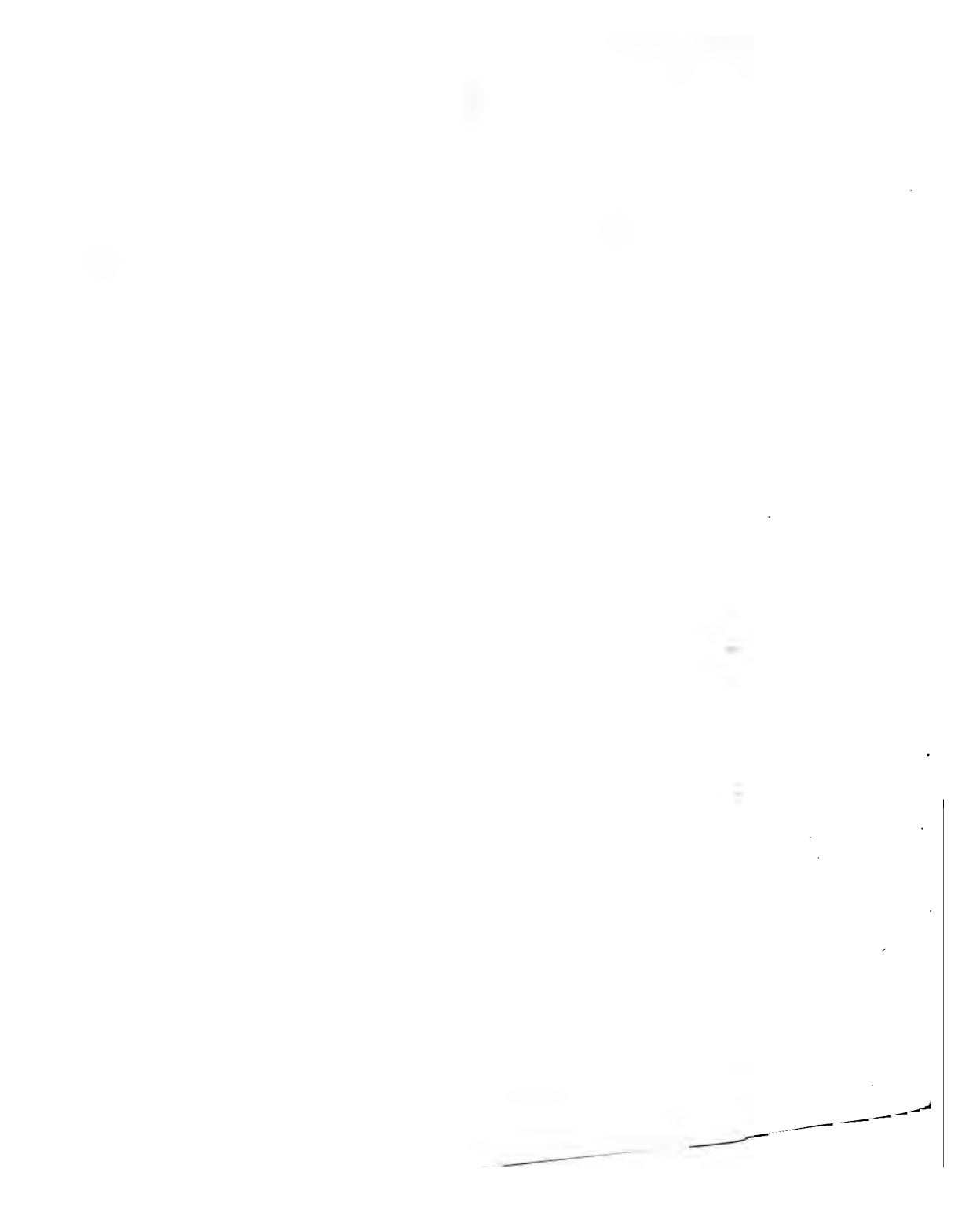
Remember, sanitation is prevention, not cure. Cleanliness is absence of smells, not addition of a strong and pleasant one to an unpleasant one.

A *healthy* body, trained by all the rules of hygiene, may pass safely through the worst conditions, while a body weakened by self-indulgences will succumb at the first exposure.

A FEW REFERENCE BOOKS

Climate and Health in Hot Countries. G. M. J. Giles.
Mosquitoes. L. O. Howard.
Household Bacteriology. S. M. Elliott.
Principles of Sanitary Science and the Public Health. W. T. Sedgwick.
Street Cleaning and Disposal of the City's Waste. G. E. Waring, Jr.
Garbage Crematories in America. W. M. Venable.
Home Sanitation. Richards and Talbot.
Sanitary and Applied Chemistry. E. H. S. Bailey.
Care of a House. T. M. Clark.
Laws: See State Digests or Bulletins.
The Human Mechanism. Hough and Sedgwick.
Personal Hygiene. Maurice LeBosquet.
Personal Hygiene. A. A. Woodhull.
Health, Strength and Power. D. A. Sargent.
The Efficient Life. Luther Gulick.

These and other books on these subjects may be obtained from Whitcomb & Barrows, Boston.



INDEX

Air, viii, 9, 24, 26, 27, 29, 75
  Current, Tests, 37
  Experiments, 37
American Public Health Association, 7
Antiseptics, 70

Belief, Habits of, vii
Board of Health, 20, 63, 69
Bulletins, Health and Sanitary, 63, 64

Carbon dioxide, 24
  Testing for, 38–42
Chemicals, 3
City, The Clean, 9–24
Civic Pride, 17
Clean, 2, 3
  Clothes, 37
  Fingers, 36, 51
  Hands, 3, 5, 56
  House, 24–47
  Milk, 18, 19
  Water, 35
Cleanliness, Habits of, 47–50
Cleanness, 1, 5
Climate, v, 10, 70
Clothes, 3, 37, 54, 55
Cold, 9
Colonies, Dust, 4, 6
Community, v, 11
  Control, 10
  Life, 9
Confident Life, 71–78
Conscience, Social, 10
Contagion, 1
Coöperation, v
Cremation, 10, 15
Cremation of Garbage, 20

Daily Life, Sanitation in, v
Dampened Duster, 4, 5, 55
Dampened Sawdust, 56
Dew-Point, 31
Dirt, 1, 23, 48, 75
Disease, 2, 9, 71
Dumont, M. Leon, 50
Dust, 2, 9, 11, 26, 33, 61, 75, 77
  Experiments, 3–8, 55
Duster, Dampened, 4, 5, 55

Ecology, v
Education, 62, 66
Efficiency, v, vi
Elliott, 8
Environment, v, vi, vii, 10
Euthenics, 71–78
Experiments, 3–8, 20–23, 37–46, 55–58, 68–70

Fit, Physically, vii
Fitness, vii
Fleas, 67
Flies, 62, 63, 67, 72, 76
Food, viii, 74

Garbage, v, 11, 13, 21, 68
Germs, 2, 6, 9, 48

Habits, vii, viii, 28, 47, 49, 50, 51, 52, 53, 75, 76
Health, v, vi, vii, 47
Health Education League, 66
"Health, Strength and Power," vi
Healthy Body, vi
Housekeeping, Family, v
  Municipal, v
Humidity, 28, 30, 42
  Table of, 32

Ice Cream, 17
Immunity, 71–78
Individual, v
Inspection, 61, 68, 73
Inspector, vii

James's Psychology, 50

Law, 60, 66
of Sanitation, vii, viii, 2
Leach, 23
Lord Derby, 68

Malaria, 10
"Mankind in the Making," vi
Microbes, 1, 48
Milk, Changes in, 22
Clean, 17–19, 65, 77
Mosquito, 11, 20, 67
Municipal Housekeeping, v

National League, 68
Neighbor, vii, 10
Norton, Prof. J. Pease, 65

Occupation, vi
Organisms, 1, 2, 4

Parks, 11, 12
Partial Death Rate, 26
Pathways, 11, 12
Peppermint Test, 38
Petri Dishes, 3, 5, 6, 22
Physically Fit, vii
Unfit, vi
Plants in the House, 33
Prescott & Winslow, 7
Prevention, 16
Prologue, v
Public Health Work, 63, 64
Public Opinion, 9

Richardson, Benjamin Ward, 9
Rubbish, 11, 67, 68

Rules of Conduct, 69
Rules of Safety, 77

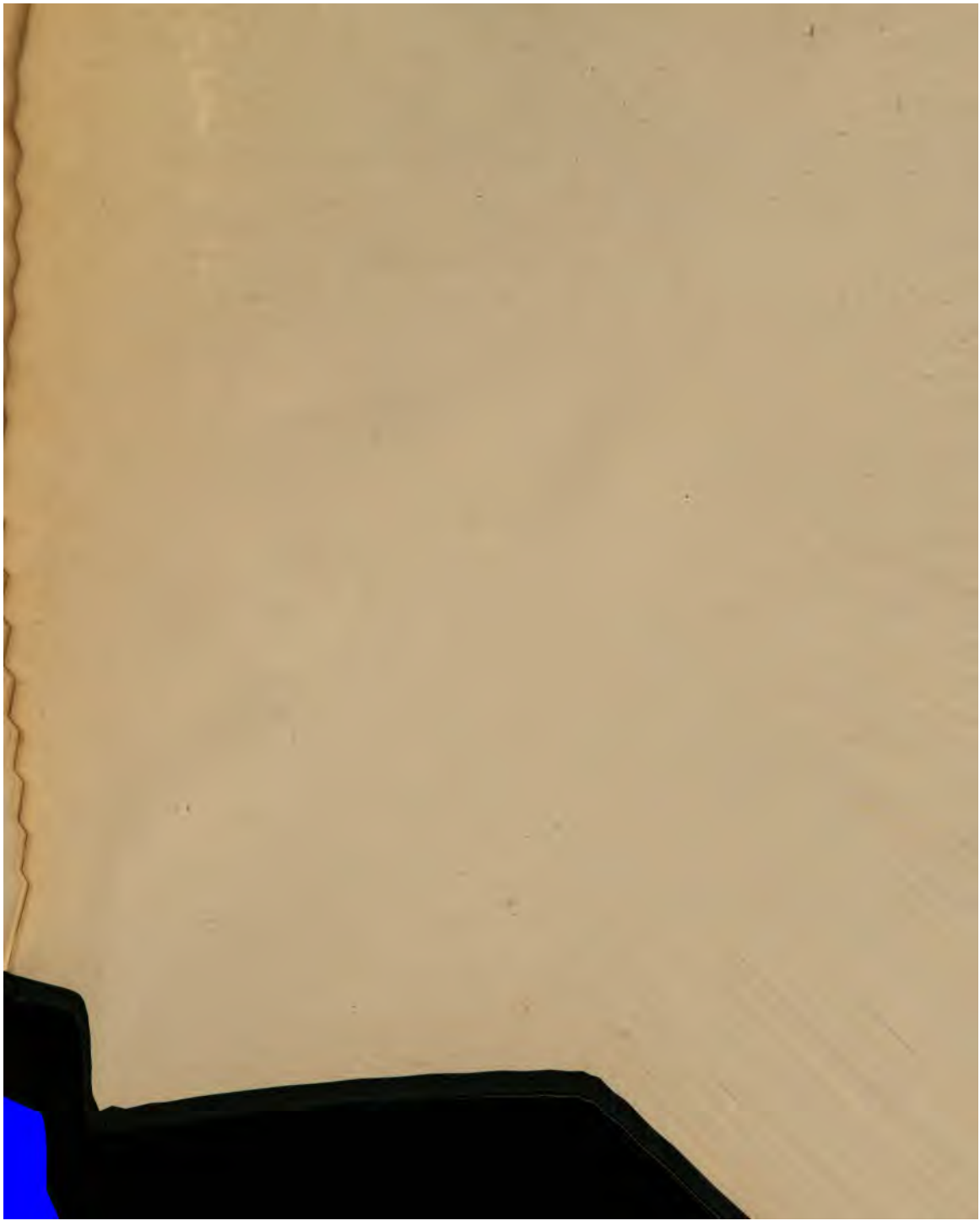
Sanitary, v, 3, 11
Regulations, v, 11, 50–71
Science, v
Teaching, viii
Sanitation, v, 1, 2, 3, 10, 78
First Law of, vii, 2
in Daily Life, v
in relation to Food, 74
Second Law of, viii
Sargent, D. A., v, 1
Science, v, 3
Sewage, 14
Skin, 1
Social Conscience, 10
Spit, 1, 53
Spitting, vii
Standards, 11
Subway, New York, 9
Sweepings, 14

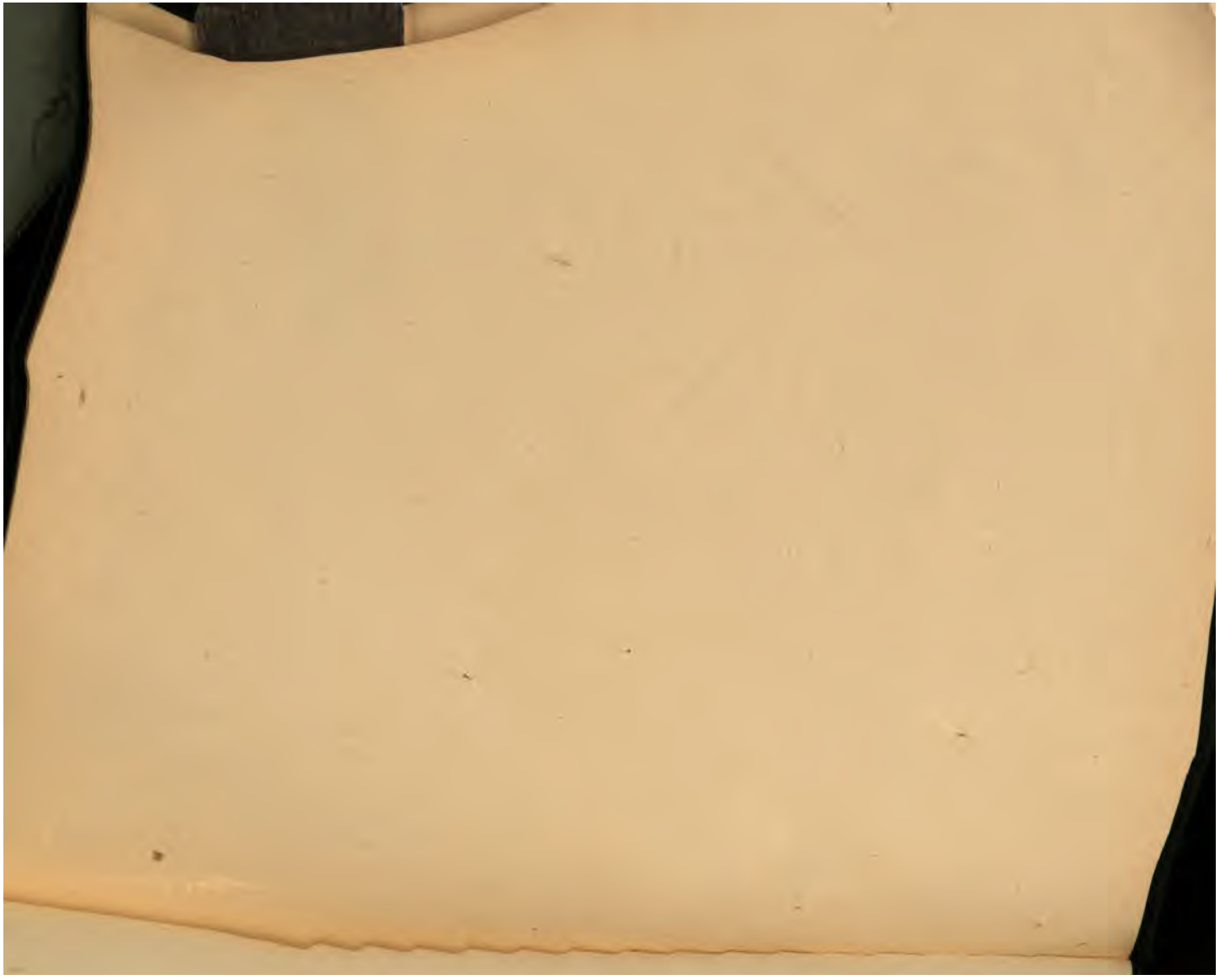
Tenements, vi
Tetanus, 2
Thermometers, 30
Three Essentials for Life, 25
Tuberculosis, 1, 25

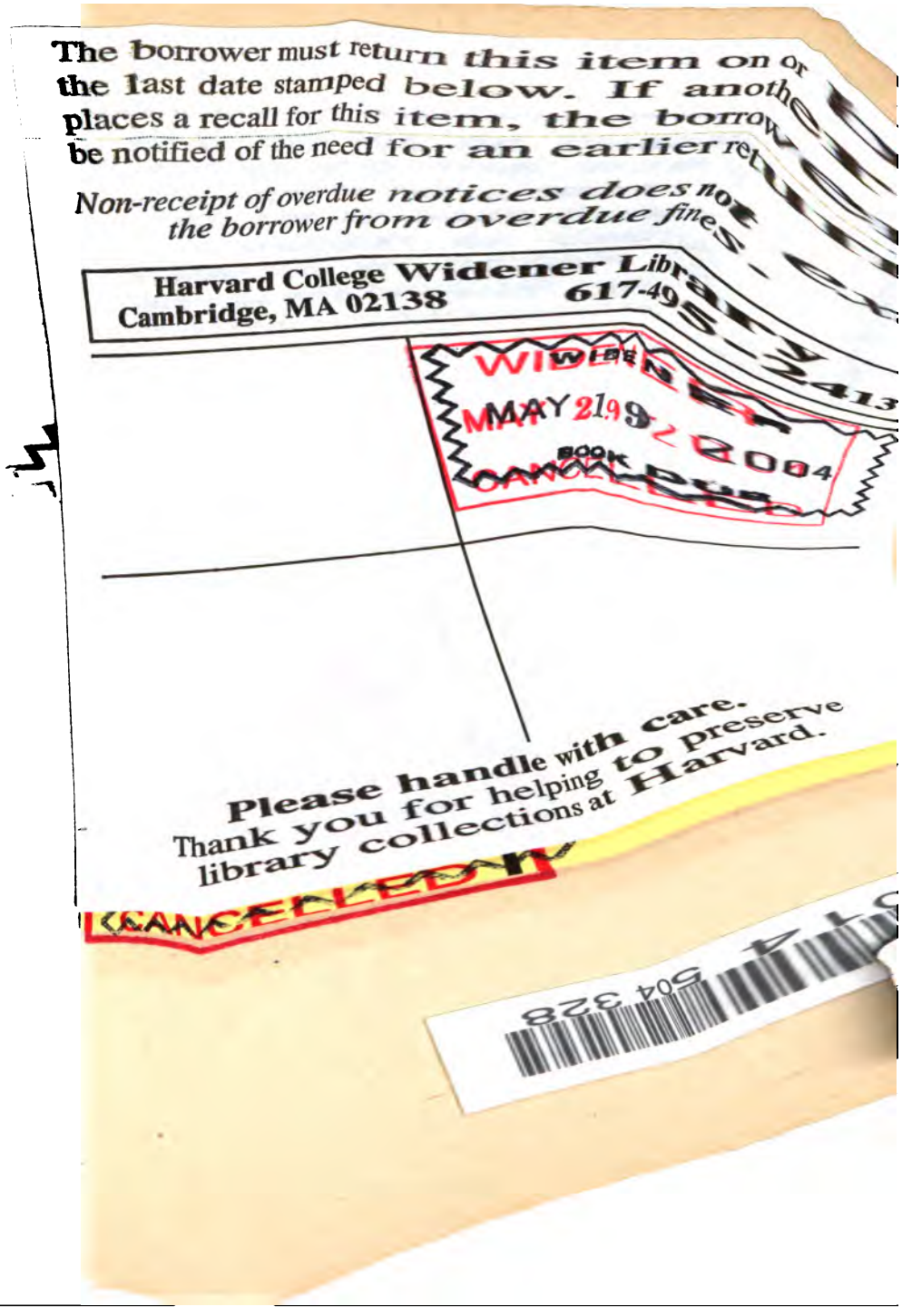
Unfit, Physically, vi

Wastes, vii, 2, 10, 12, 13, 14, 15, 16, 53, 78
Water, viii, 34, 35, 36, 42–46, 77
Wells, H. G., vi, 1

Yellow Fever, 10, 11






The borrower must return this item on or
the last date stamped below. If another
places a recall for this item, the borrow
be notified of the need for an earlier re
Non-receipt of overdue notices does not
the borrower from overdue fines
Harvard College Widener Library
Cambridge, MA 02138
617-495-2413
WIDENER
MAY 21 2004
BOOK
CANCELED
Please handle with care.
Thank you for helping to preserve
library collections at Harvard.
CANCELED
504 328